CLAIMS

1. A rare earth zeolite Y, wherein said zeolite has an intracrystalline rare earth content of 4-15 wt% on the basis of RE_2O_3, a unit cell constant of 2.450-2.458 nm, a differential thermal collapsed temperature of 1000-1056°C, and a unit cell size above 2.436 nm under an aging condition of 800°C/17 hr, 100% steam.

2. The zeolite Y according to claim 1, wherein the content of the intracrystalline rare earth on the basis of RE_2O_3 is 6-12 wt%, the unit cell constant is 2.452-2.456 nm, the silica to alumina ratio is 8.3-8.8, and the content of sodium oxide is less than 1.0 wt%.

3. The zeolite Y according to claim 1, wherein the content of sodium oxide in said zeolite is less than 0.5 wt%.

4. A process for preparing the rare earth zeolite Y comprising treating rare earth-containing zeolite Y with gaseous silicon tetrachloride.

5. The process according to claim 4 comprising drying the rare earth-containing zeolite Y to a water content of less than 10 wt%, introducing gaseous silicon tetrachloride carried by dry air in a silicon tetrachloride to zeolite Y weight ratio of 0.1-0.9:1, reacting at a temperature of 150-600°C for 10 min to 6 h, purging with dry air for 5min to 2 hr, and washing with de-cationized water.

6. The process according to claim 5, wherein said rare earth zeolite Y is selected from the group of the commercial products of REY,

REHY, or the product derived from NaY exchanged by rare earth, with or without drying.

7. The process according to claim 6, wherein the content of the rare earth in said commercial product REHY on the basis of RE_2O_3 is 6-14 wt%, and the content of Na_2O is higher than 4 wt%.

8. The process according to claim 6, wherein the content of the rare earth in said commercial product REY on the basis of RE_2O_3 is 10-20 wt%, and the content of Na_2O is higher than 2 wt%.

9. The process according to claim 6, wherein the rare earth exchanged zeolite Y is produced by a process comprising: the zeolite NaY having a silica to alumina ratio higher than 3.5 is exchanged with an aqueous solution of rare earth chloride for 30-60 min in a weight ratio of $NaY:RECl_3:H_2O$ = 1:0.1-0.25:5-15 under conditions of pH>3.5 and a temperature of 80-95°C.

10. The process according to claim 5, wherein the water content in said rare earth-containing zeolite Y after drying is less than 5 wt%.

11. The process according to claim 5, wherein said reaction temperature is 200-500°C.

12. A rare earth zeolite Y, wherein said zeolite, after a treating process which includes reacting with gaseous silicon tetrachloride, has a unit cell size above 2.436 nm under aging condition of 800°C/17 hr, 100% steam.

13. The rare earth zeolite Y according to claim 12 having a silica to alumina ratio of no less than 8.3 and a sodium oxide content of less than 1.0 wt%, wherein the silica to alumina ratio is calculated by the following formula:

$$SiO_2/Al_2O_3 = \frac{(2.5858 - a_0)}{(a_0 - 2.4191)} \times 2$$

Wherein a_0 is the unit cell constant of zeolite measured by X-ray diffraction method.

14. The rare earth zeolite Y according to claim 13, wherein the silica to alumina ratio of is no more than 8.8.